



PRODUCT CATALOGUE



TAVRIDA ELECTRIC IS A GROUP OF COMPANIES THAT SPECIALIZES IN THE DEVELOPMENT AND MANUFACTURE OF INNOVATIVE SWITCHGEAR PRODUCTS FOR INDOOR AND OUTDOOR APPLICATIONS IN MEDIUM VOLTAGE (MV) SMART GRIDS. TAVRIDA ELECTRIC CONDUCTS EXTENSIVE RESEARCH AIMED AT DEVELOPING NEW SWITCHING AND CONTROL TECHNOLOGIES, WITH A PRIMARY FOCUS ON RESOLVING CUSTOMER PROBLEMS NOT MET BY CURRENT PRODUCTS ON THE MARKET.

ADVANTAGES



MAINTENANCE FREE



MOST COMPACT DIMENSIONS AND WEIGHT



HIGH OPERATIONAL SPEED



EASE OF USE AND OPERATOR'S SAFETY



ENVIRONMENTAL SAFETY



PRODUCT CATALOGUE

VACUUM CIRCUIT BREAKERS

High performance vacuum circuit breakers for compact switchgear designs, existing plant refurbishment/retrofit programs and special applications.



AUTOMATIC CIRCUIT RECLOSERS

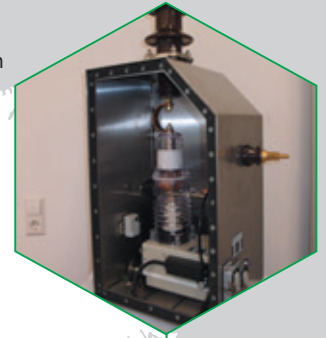
Automatic circuit recloser for substation automation, distributed generation and important load connections. Suitable for ring, radial and meshed overhead lines. A core element of contemporary smart grid networks.



OUR WORLDWIDE PROJECTS

Tavrida Electric solutions ensure reliable power system operation in more than 80 countries.

UNITED KINGDOM
Transformer mounted switch for Arc Suppression Coil (Petersen coil) bypass.



USA
Massachusetts Solar fields grid connection points.



USA
Texas Oil fields power distribution network automation.





MEXICO
Mexico city distribution network automation.



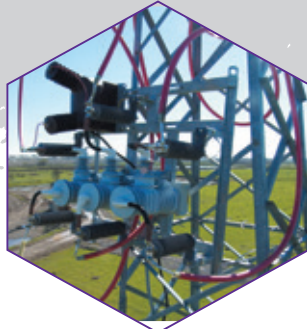
ITALY
Circuit breakers for largest European utility – ENEL.

-  Distribution
-  Industry
-  Generation
-  Commercial buildings and enterprises
-  Oil and Gas
-  Mining
-  Distributed generation

-  Vacuum circuit breakers
-  Automatic circuit reclosers

BRAZIL
FIFA 2014 stadium power supply – Arena Corinthians in Sao Paulo.

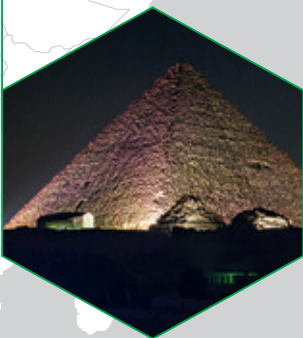




TURKEY
35kV Radial Overhead Line
Protection Solution



CHINA
Oil fields power
distribution network
automation.



EGYPT
Great Pyramids lighting
power supply.



INDIA
Power supply quality
improvement projects.



SOUTH AFRICA
Motor feeders at deepest in the world
mines Tau-Tona and Mponeng.



Vacuum Circuit Breakers VCB15/25

SIMPLICITY IS PERFECTION

Gears, springs, bearings, levers and other rotating parts are the most often causes of conventional circuit breaker failure. Luckily Tavrída Electric breakers are better than conventional. Tavrída Electric has simplified its breaker design – completely removing all components prone to failure. As the result VCB has 20 times the reliability of conventional circuit breakers and furthermore doesn't require any maintenance in service.



ANY SPATIAL
ORIENTATION



LIGHTEST
IN THE WORLD



MOST COMPACT
DIMENSIONS



MAINTENANCE
FREE



CONTINUOUS
SELF-SUPERVISION



SINGLE
PHASE OPTION



30,000 CLOSE
OPEN OPERATIONS

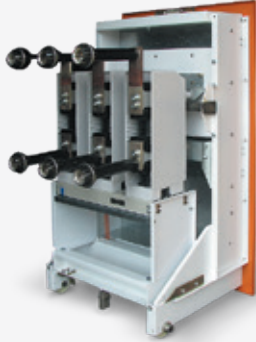
YOUR SWITCHGEAR, DEFINED AND DESIGNED IN ACCORDANCE WITH YOUR VISION

You know your switchgear best; you know how to optimize its design and how it should operate. That's why the Tavrída Electric VCB series circuit breaker is so revolutionary – because it puts the design control in your hands. With the smallest dimensions on the market and ANY circuit breaker orientation, you are free to optimize your switchgear design, define how to make primary and secondary connections, and lay your

secondary circuits. That means you can guarantee the optimal use of space and convenient access to the control elements without having the need to compromise on something. Want even higher flexibility? Weighing just 33 kg, the Tavrída Electric's circuit breaker is the smallest and lightest circuit breaker in the world. Impress your customers with unique switchgear designs no-one else can copy.

Application

OEM Solutions & VCBs for Retrofit



Tavrida Electric cooperates with more than 400 switchgear manufacturers and retrofit solutions providers. Over many years of cooperation, Tavrida Electric VCBs have proved versatile and easy-to-use for both new and

existing switchgear panel designs, as well as for retrofit solutions. They are the smallest and lightest solution on the market, work regardless of orientation and are easy to install.

Special Application Circuit Breakers



FAST TRANSFER SWITCHES

With transfer times as fast as 2 cycles. Such quick operational times allow very sensitive loads to operate without interruption in the case of a main power source loss. The fast transfer switch solution:

- Eliminates costly downtime,
- Reduces production equipment stress,
- Ensures quick return on investment.

ARC FLASH MITIGATION

With interruption in one period. That quick interruption time:

- Increases operational safety,
- Reduces switchgear restoration time

- and loss of productivity,
- Reduces costly downtime,
- Limits switchgear damage and repair costs.

FAULT CURRENT LIMITER

Sub period interruption time limits short circuit current effectively by quickly disconnecting distributed generation sources from the grid.

- Allows more distributed generation, to be connected to the grid,
- Limits fault current,
- No operational losses,
- Enables automatic distributed, generation sources reconnection.

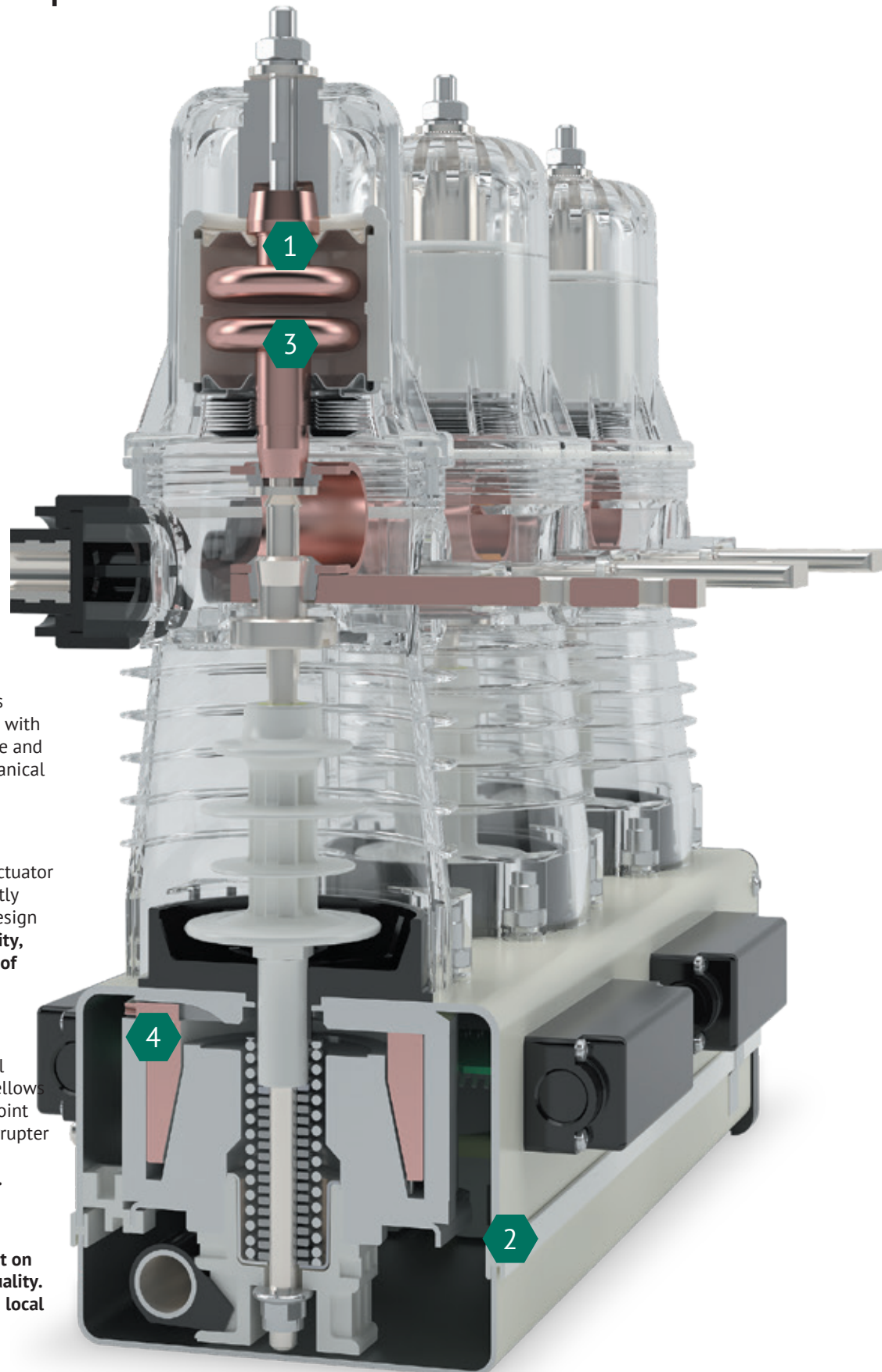
Single Phase Circuit Breakers



Tavrida Electric's circuit breakers are the perfect match for applications like transformers or generators with a neutral earthing, server rooms and point on wave switching. The circuit

breakers weigh less than 14 kg, meaning they can be installed quickly and cost effectively even in the smallest designs.

Design and Operation



① Tavrída Electric manufactures compact vacuum interrupters with high interrupting performance and an extraordinarily long mechanical and electrical lifespan.

② The patented design of the actuator allows it to be installed directly underneath each pole. The design is optimal in terms of **reliability, dimensions, weight and ease of installation.**

③ The use of robot welded steel discs as opposed to folded bellows eliminates the main failure point of conventional vacuum interrupter designs and maintains a **high vacuum for its entire lifetime.**

④ The actuator is **not dependent on the auxiliary power supply quality.** The mechanism enables both **local and remote operation.**

Control Module CM_16

The Control Module is an intelligent circuit breaker driver that provides energy for circuit breaker operation. It controls and optimises main contacts movement in the manner that prolongs circuit breaker life and continuously monitors circuit breaker trip and close circuits.

CONTINUOUS SELF-SUPERVISION

Vacuum circuit breakers equipped with the CM16 control module continuously monitor and control switching modules, functional wiring and auxiliary power supply quality. The CM16 eliminates the necessity of additional trip and close coils, charging mechanisms and all related wiring supervision. The whole trip and close circuit supervision comes in a single package with any Tavrída Electric VCB. The CM16 allows the user to forget about scheduled trips and close wiring inspections – as in the event of malfunction a notification will be sent to the operator using one of the inbuilt output relays and indicated by LEDs inbuilt into the control module.

LOW POWER CONSUMPTION

Vacuum circuit breakers equipped with the CM16 control module need less than 42 W – just 10% of what the best alternatives available on the market need! Such low power consumption finally solves the problem of auxiliary power supply – a much less powerful source and UPS can now provide substation auxiliary equipment with the required power.

EASE OF USE AND ROBUSTNESS

CM16 type control modules are connected with the circuit breaker they control and supervise by means of simple wires. This allows the CM installation to be located at any position convenient for the OEM, system integrator or end-user location. Very compact dimensions and low weight further simplify the process. The CM16 has a robust design, enclosed in an aluminium housing it provides a high EMC level confirmed by KEMA test laboratories.



- 5 The energy for switching operations is stored in the Control Module (CM). This reduces **the auxiliary power supply needs to 1/10 of a conventional circuit breaker** and enables significant savings on Substation UPS and auxiliary equipment.
- 6 Embedded intelligence – The CM's **continuous self-supervision** function monitors control, switching modules, functional wiring and auxiliary power supply quality. In the event of malfunction, a notification will be sent to the operator and indicated by inbuilt LEDs.
- 7 The CM can be conveniently installed at a distance from the circuit breaker and connected by means of flexible leads. It significantly simplifies the installation and allows the CM to be installed with other low voltage devices.

Light Duty

LD series vacuum circuit breakers for rated continuous current up to 800 A. Available in three-phase and single phase configurations and for rated voltages up to 24 kV.



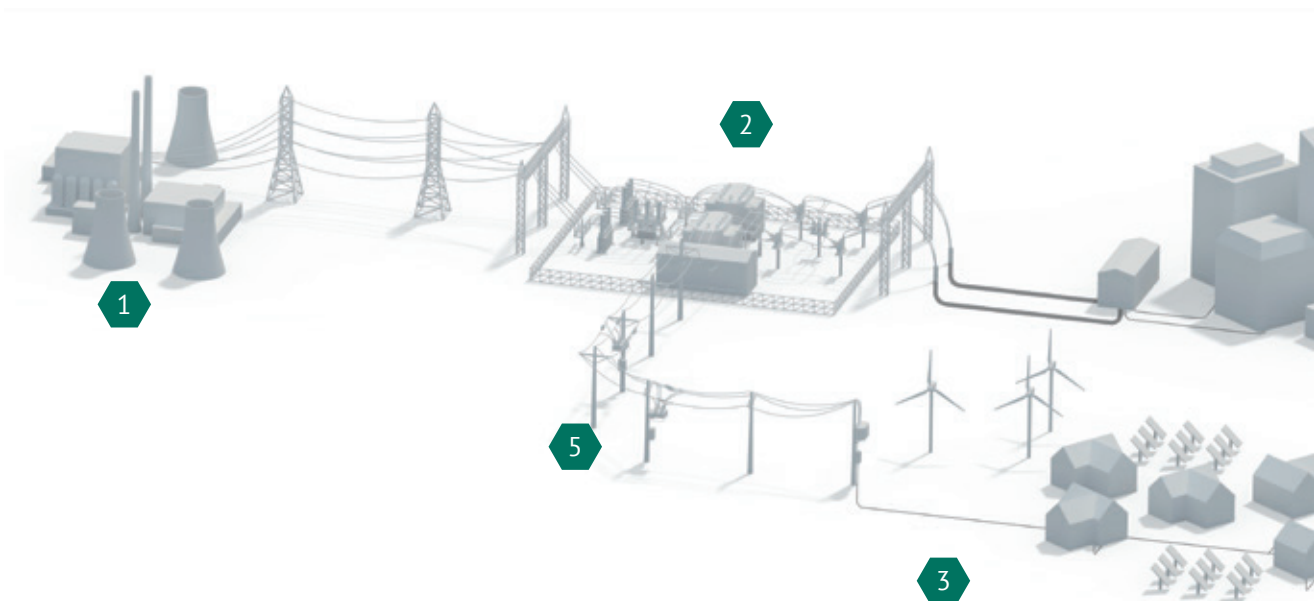
Single Phase Vacuum Circuit Breaker



Tavrída Electric's circuit breakers are the perfect match for applications like transformers or generators with a neutral earthing, server rooms and point on wave switching.

APPLICATION:

- ① Generation plant: generator neutral earthing.
- ② Transformer substation: transformer neutral earthing.
- ③ Distributed generation: generator or transformer neutral earthing.
- ④ Building and enterprises: single phase loads switching.
- ⑤ Distribution: single phase switching.
- ⑥ Distribution substations: auxiliary power transformer circuit breaker.



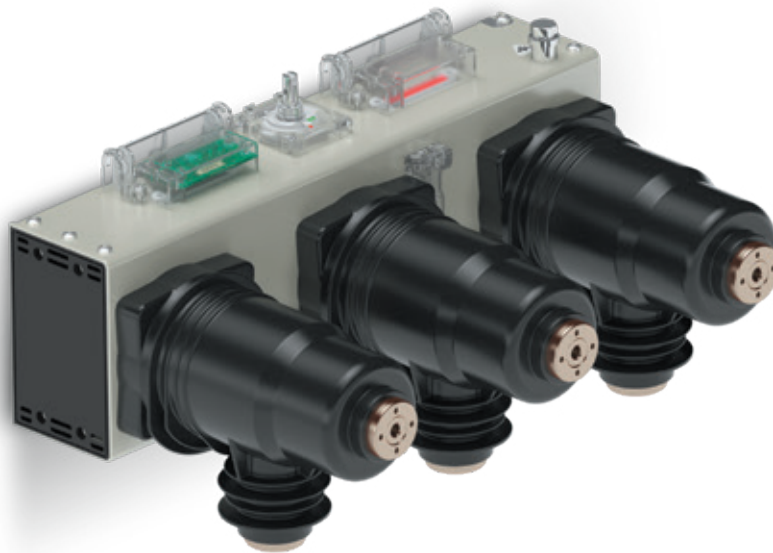


Medium Duty

A brand new vacuum three-phase and single-phase circuit breakers type for rated continuous currents up to 1250 A and rated voltages up to 17.5 kV with extraordinarily small size and weight.



Using the same single-axis design philosophy as the LD series, the MD series brings even more innovation in a compact package. At a height of only 35 cm, and as narrow as the LD type, the MD circuit breaker handles currents as high as 1250 A continuous and 31.5 kA short-time and interrupting. Together with any spatial orientation capability, the MD series circuit breaker is second to none in terms of switchgear design optimization and mounting simplicity.





MAINTENANCE
FREE



CONTINUOUS
SELF-SUPERVISION



MOST RELIABLE



MOST COMPACT
DIMENSIONS AND WEIGHT



THE FASTEST
ON THE MARKET

Shell series

Shell vacuum circuit breakers are designed for applications with high rated continuous currents up to 2000 A and voltages up to 25 kV.

The exceptional shell-type design insulates the phases from each other, with multiple mounting points incorporated to allow for installation in flexible orientations (vertical or inverted). It is not only robust and durable to high ratings but it is also the fastest circuit breaker on the market with an ability of sub-period current interruption.

The Shell series simplifies interlocking functionality using an integrated manual trip lever at the rear to block the unit both electrically and mechanically.

Heavy Duty

Heavy Duty series breakers are the most enduring across our product range and designed for rated continuous currents up to 3150 A. HD finally brings all advantages of the best secondary distribution circuit breakers by Tavrida Electric to a primary distribution class. Never before VCBs with such high ratings were so compact and applicable for the most confined panels.





MAINTENANCE FREE



CONTINUOUS SELF-SUPERVISION



MOST RELIABLE



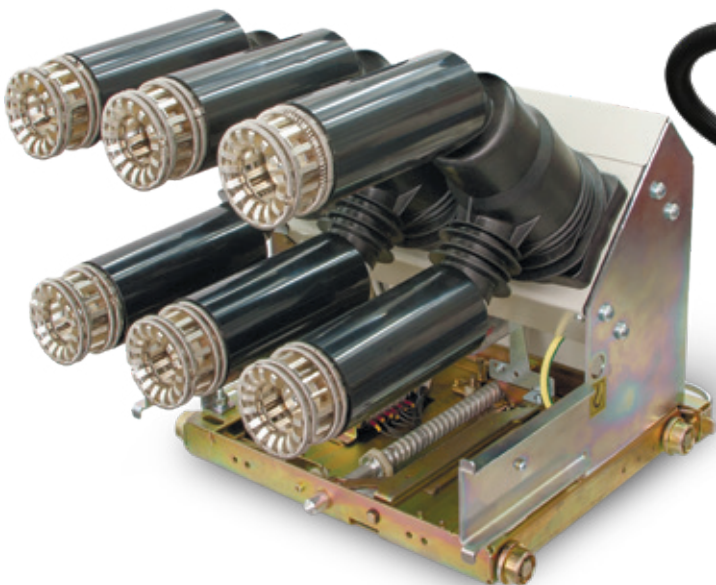
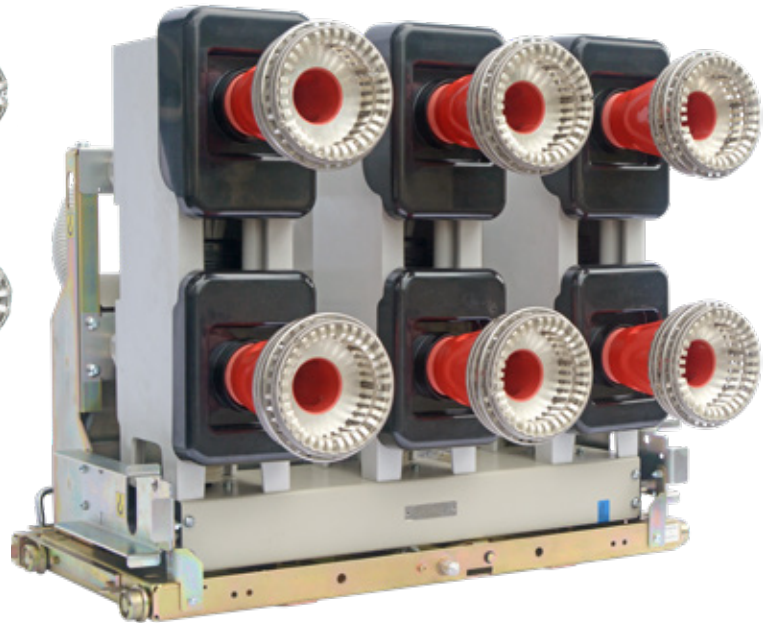
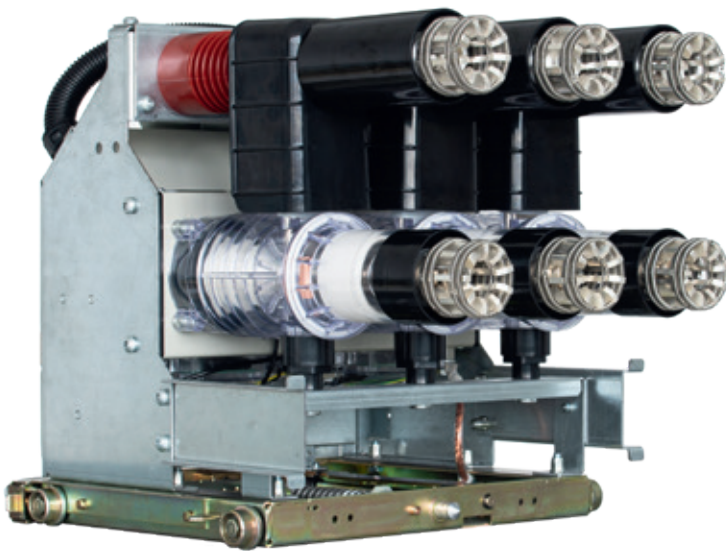
MOST COMPACT DIMENSIONS AND WEIGHT



THE FASTEST ON THE MARKET

Draw-Out Units

Medium duty and Heavy duty vacuum circuit breakers are now also available in withdrawable design with rack-in cassette, guide-arms and tulip contacts. Tavrída Electric draw-out units are fully compatible with industry standard interfaces. The personnel safety is brought to a maximum level with embedded mechanical and electrical interlocking.



Specification

VCB15 LD Series

Technical Parameters



VCB15_LD1



VCB15_LD3



VCB15_LD8

PARAMETER	VCB15_LD1		VCB15_LD3	VCB15_LD8
Rated voltage (Ur)	12 kV	17.5 kV	12 kV	17.5 kV
Rated normal current (Ir)	800 A			
Rated power frequency withstand voltage (Ud)	28 (42) kV ¹⁾	38 (42) kV ¹⁾	28 (42) kV ¹⁾	38 (42) kV ¹⁾
Rated lightning impulse withstand voltage (peak) (Up)	75 kV	95 kV	75 kV	95 kV
Rated short-circuit breaking current (Isc)	20 kA ²⁾		20 kA ²⁾	25 kA ³⁾
Rated peak withstand current (Ip)	52 kA			65 kA
Rated short-time withstand current (Ik)	20 kA			25 kA
Rated duration of short circuit (tk)	4 s			
Rated frequency (fr)	50/60 Hz			
Mechanical life (CO-cycles)	50,000			
Maximum number of CO-cycles per hour	60			
Operating cycles, rated – short circuit breaking current	100			
Closing time	≤ 70 ms ⁴⁾			
Opening time	≤ 35 ms ⁴⁾			
Break time	≤ 45 ms ⁴⁾			
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁵⁾			
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO			
Resistance of main circuit	≤ 40 μOhm			
Weight (depending on Phase centre distance)	34–36 kg		13 kg	25-26 kg
Package dimensions, not more than (LxWxH), mm	645x330x550		645x290x550	790x290x550
Weight of CM	1 kg			
Overall dimensions of CM, mm	190x165x45			
Altitude above sea level	1000 m ⁶⁾			
Relative humidity in 24 hours	≤ 95%			
Relative humidity over 1 month	≤ 90%			
Temperature range	-25°C ... +55°C			
Degree of protection according to IEC 60529	IP40			
Type of driving mechanism	Monostable magnetic actuator			
Number of available auxiliary contacts	6 NO + 6 NC		2 NO + 2 NC	Variable: Up to 12NO+12NC

1) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

2) At 40% d.c. component.

3) At 34% d.c. component.

4) Smaller timing on request.

5) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB15 MD Series

Technical Parameters



VCB15_MD1



VCB15_MD3

PARAMETER	VCB15_MD1	VCB15_MD3
Rated voltage (Ur)	17.5 kV	
Rated normal current (Ir)	1250 A	
Rated power frequency withstand voltage (Ud)	38 (42) kV ¹⁾	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV ²⁾	
Rated short-circuit breaking current (Isc)	31.5 kA ³⁾	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	4 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	50,000
Maximum number of CO-cycles per hour	60	
Operating cycles, rated – short circuit breaking current	50	
Closing time	≤ 60 ms ⁴⁾	
Opening time	≤ 35 ms ⁴⁾	
Break time	≤ 45 ms ⁴⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁵⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 17 μOhm	
Weight (depending on Phase centre distance)	33–35 kg	13 kg
Package dimensions, not more than (LxWxH), mm	760x315x490	300x315x190
Weight of CM	1 kg	
Overall dimensions of CM, mm	190x165x45	
Altitude above sea level	1000 m ⁶⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts	6 NO + 6 NC	2 NO + 2 NC

1) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

2) Parameter valid only when ISM is used with insulation kit. For details see dimensional drawings and accessory information (on request).

3) At 40% d.c. component.

4) Smaller timing on request.

5) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB15 Shell Series

Technical Parameters



VCB15_Shell2

PARAMETER	VCB15_SHELL2
Rated voltage (Ur)	17.5 kV
Rated normal current (Ir)	1250 A ¹⁾ 2000 A
Rated power frequency withstand voltage (Ud)	38 (42) kV ²⁾
Rated lightning impulse withstand voltage (peak) (Up)	95 kV ³⁾
Rated short-circuit breaking current (Isc)	31.5 kA ⁴⁾
Rated peak withstand current (Ip)	82 kA
Rated short-time withstand current (Ik)	31.5 kA
Rated duration of short circuit (tk)	4 s
Rated frequency (fr)	50/60 Hz
Mechanical life (CO-cycles)	30,000 ⁵⁾
Maximum number of CO-cycles per hour	60
Operating cycles, rated – short circuit breaking current	50
Closing time	≤ 60 ms ⁶⁾
Opening time	≤ 35 ms ⁶⁾
Break time	≤ 45 ms ⁶⁾
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁷⁾
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO
Resistance of main circuit	≤ 18 μOhm
Weight (depending on Phase centre distance)	51 – 55 kg
Package dimensions, not more than (LxWxH), mm	790x275x800
Weight of CM	1 kg
Overall dimensions of CM, mm	190x165x45
Altitude above sea level	1000 m ⁸⁾
Relative humidity in 24 hours	≤ 95 %
Relative humidity over 1 month	≤ 90 %
Temperature range	-25°C ... +55°C
Degree of protection according to IEC 60529	IP40
Type of driving mechanism	Monostable magnetic actuator
Number of available auxiliary contacts	6 NO + 6 NC

1) For VCB ISM15_Shell with Low upper terminal – up to 1250 A, with High upper terminal – up to 2000 A.

2) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

3) Parameter valid only when ISM is used with insulation kit. For details see dimensional drawings and accessory information (on request).

4) At 40% d.c. component.

5) 10 000 CO – for ISM15_Shell_2(150_L) and ISM15_Shell_2(210_L) in horizontal actuator position.

6) Smaller timing on request.

7) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

8) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB15 HD Series

Technical Parameters



VCB15_HD1

PARAMETER	VCB15_HD1
Rated voltage (Ur)	17.5 kV
Rated normal current (Ir)	2500 A ¹⁾ 3150 A ²⁾
Rated power frequency withstand voltage (Ud)	38 (42) kV ³⁾
Rated lightning impulse withstand voltage (peak) (Up)	95 kV
Rated short-circuit breaking current (Isc)	31.5 kA ⁴⁾
Rated peak withstand current (Ip)	82 kA
Rated short-time withstand current (Ik)	31.5 kA
Rated duration of short circuit (tk)	4 s
Rated frequency (fr)	50/60 Hz
Mechanical life (CO-cycles)	30,000
Maximum number of CO-cycles per hour	60
Operating cycles, rated–short circuit breaking current	50
Closing time	≤ 60 ms ⁵⁾
Opening time	≤ 35 ms ⁵⁾
Break time	≤ 45 ms ⁵⁾
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁶⁾
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO
Resistance of main circuit	≤ 15 μOhm
Weight (depending on Phase centre distance)	70–72 kg
Package dimensions, not more than (LxWxH), mm	830x330x680
Weight of CM	1 kg
Overall dimensions of CM, mm	190x165x45
Altitude above sea level	1000 m ⁷⁾
Relative humidity in 24 hours	≤ 95 %
Relative humidity over 1 month	≤ 90 %
Temperature range	-25°C ... +55°C
Degree of protection according to IEC 60529	IP40
Type of driving mechanism	Monostable magnetic actuator
Number of available auxiliary contacts	6 NO + 6 NC

1) Rating for metal enclosed switchgear with limited ventilation. Temperature rise type test at 2500 A in Cradle was successfully passed in KEMA.

2) 3150 A – for PCD 275 mm.

3) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

4) At 40% d.c. component.

5) Smaller timing on request.

6) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

7) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB25 LD Series

Technical Parameters



VCB25_LD1



VCB25_LD3

PARAMETER	VCB25_LD1	VCB25_LD3
Rated voltage (Ur)	24 kV	
Rated normal current (Ir)	800 A	
Rated power frequency withstand voltage (Ud)	50 kV	
Rated lightning impulse withstand voltage (peak) (Up)	125 kV	
Rated short-circuit breaking current (Isc)	20 kA ¹⁾	
Rated peak withstand current (Ip)	50 kA	
Rated short-time withstand current (Ik)	20 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated – short circuit breaking current	50	
Closing time	≤ 60 ms ²⁾	
Opening time	≤ 35 ms ²⁾	
Break time	≤ 45 ms ²⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ³⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 40 μOhm	
Weight (depending on Phase centre distance)	35–38 kg	14 kg
Package dimensions, not more than (LxWxH), mm	775x290x550	645x290x550
Weight of CM	1 kg	
Overall dimensions of CM, mm	190x165x45	
Altitude above sea level	1000 m ⁴⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts	6 NO + 6 NC	2 NO + 2 NC

1) At 34 % d.c. component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB25 Shell Series

Technical Parameters



VCB25_Shell2

PARAMETER	VCB15_SHELL2
Rated voltage (Ur)	24 kV
Rated normal current (Ir)	2500 A
Rated power frequency withstand voltage (Ud)	50 kV
Rated lightning impulse withstand voltage (peak) (Up)	125 kV
Rated short-circuit breaking current (Isc)	25 kA ¹⁾
Rated peak withstand current (Ip)	65 kA
Rated short-time withstand current (Ik)	25 kA
Rated duration of short circuit (tk)	4 s
Rated frequency (fr)	50/60 Hz
Mechanical life (CO-cycles)	30,000
Maximum number of CO-cycles per hour	60
Operating cycles, rated – short circuit breaking current	25
Closing time	≤ 60 ms ²⁾
Opening time	≤ 35 ms ²⁾
Break time	≤ 45 ms ²⁾
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ³⁾
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO
Resistance of main circuit	≤ 17 μOhm
Weight (depending on Phase centre distance)	53 – 55 kg
Package dimensions, not more than (LxWxH), mm	825x328x874
Weight of CM	1 kg
Overall dimensions of CM, mm	190x165x45
Altitude above sea level	1000 m ⁴⁾
Relative humidity in 24 hours	≤ 95 %
Relative humidity over 1 month	≤ 90 %
Temperature range	-25°C ... +55°C
Degree of protection according to IEC 60529	IP40
Type of driving mechanism	Monostable magnetic actuator
Number of available auxiliary contacts	6 NO + 6 NC

1) At 34 % d.c. component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.



VCB15_LD8_16D

Withdrawable VCB15 LD Series

Technical Parameters

PARAMETER	VCB15_LD8_16D	
Rated voltage (Ur)	17.5 kV	
Phase centre distance (PCD), mm	150	210
Rated normal current (Ir)	800 A	
Rated power frequency withstand voltage (Ud)	38 (42) kV ¹⁾	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	25 kA ²⁾	
Rated peak withstand current (Ip)	65 kA	
Rated short-time withstand current (Ik)	25 kA	
Rated duration of short circuit (tk)	4 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated – short circuit breaking current	50	
Closing time	≤ 60 ms ³⁾	
Opening time	≤ 35 ms ³⁾	
Break time	≤ 45 ms ³⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁴⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 55 μOhm	
Weight (depending on Phase centre distance)	70–81 kg	
Minimum overall dimensions (L _{min} x W _{min} x H _{min}), mm	677x535x528	
Maximum overall dimensions (L _{max} x W _{max} x H _{max} ⁵⁾), mm	687x682x633	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m ⁶⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

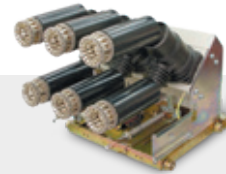
2) At 34% DC component.

3) Smaller timing on request.

4) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

5) Maximum size with IP2X front cover.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.



VCB15_MD1_16D

Withdrawable VCB15 MD Series

Technical Parameters

PARAMETER	VCB15_MD1_16D	
Rated voltage (Ur)	17.5 kV	
Phase centre distance (PCD), mm	150	210
Rated normal current (Ir)	1250 A	
Rated power frequency withstand voltage (Ud)	38 (42) kV ¹⁾	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	31.5 kA ²⁾	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	4 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated – short circuit breaking current	50	
Closing time	≤ 60 ms ³⁾	
Opening time	≤ 35 ms ³⁾	
Break time	≤ 45 ms ³⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁴⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 31 μOhm	
Weight (depending on Phase centre distance)	72 – 88 kg	
Minimum overall dimensions (L _{min} x W _{min} x H _{min}), mm	677x535x515	
Maximum overall dimensions (L _{max} x W _{max} x H _{max} ⁵⁾), mm	677x682x630	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m ⁶⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

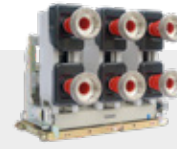
2) At 40% DC component.

3) Smaller timing on request.

4) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

5) Maximum size with IP2X front cover.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.



VCB15_HD1_16D

Withdrawable VCB15 HD Series

Technical Parameters

PARAMETER	VCB15_HD1_16D	
Rated voltage (Ur)	17.5 kV	
Phase centre distance (PCD), mm	210/275	275
Rated normal current (Ir)	2500 A ¹⁾	3150 A
Rated power frequency withstand voltage (Ud)	38 (42) kV ²⁾	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	31.5 kA ³⁾	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	4 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms ⁴⁾	
Opening time	≤ 35 ms ⁴⁾	
Break time	≤ 45 ms ⁴⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁵⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 25 μOhm	≤ 20 μOhm
Weight (depending on Phase centre distance)	128–165 kg	
Minimum overall dimensions (L _{min} x W _{min} x H _{min} ⁶⁾), mm	656.5x682x704	
Maximum overall dimensions (L _{max} x W _{max} x H _{max} ⁶⁾), mm	656.5x882x742	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m ⁷⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) The rating depends on the metal-enclosed switchgear ventilation. Temperature rise type test at 2500 A in Cradle was successfully passed in KEMA.

2) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

3) At 40% DC component.

4) Smaller timing on request.

5) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

6) Maximum size with IP2X front cover.

7) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.



VCB25_Shell2_16D

Withdrawable VCB25 Shell Series

Technical Parameters

PARAMETER	VCB25_SHELL2_16D	
Rated voltage (Ur)	24 kV	
Phase centre distance (PCD), mm	210/275	275
Rated normal current (Ir)	630 A 1250 A	2500 A
Rated power frequency withstand voltage (Ud)	50 (60) kV ¹⁾	
Rated lightning impulse withstand voltage (peak) (Up)	125 kV	
Rated short-circuit breaking current (Isc)	25 kA ²⁾	
Rated peak withstand current (Ip)	65 kA	
Rated short-time withstand current (Ik)	25 kA	
Rated duration of short circuit (tk)	4 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms ³⁾	
Opening time	≤ 35 ms ³⁾	
Break time	≤ 45 ms ³⁾	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO ⁴⁾	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 35 μOhm ⁵⁾	≤ 22 μOhm
Weight (depending on Phase centre distance)	101–190 kg	
Minimum overall dimensions (L _{min} x W _{min} x H _{min}), mm	803.5x682x692	
Maximum overall dimensions (L _{max} x W _{max} x H _{max} ⁶⁾), mm	813.5x882x817	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m ⁷⁾	
Relative humidity in 24 hours	≤ 95 %	
Relative humidity over 1 month	≤ 90 %	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) The information in brackets refers to the national Chinese standards GB1984-2003 at an installation altitude of 1000 m maximum.

2) At 34 % DC component.

3) Smaller timing on request.

4) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

5) ≤ 35 μOhm (for Ir 630 A); ≤ 30 μOhm (for Ir 1250 A).

6) Maximum size with IP2X front cover.

7) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

Control Module Technical Parameters



PARAMETER	VALUE
CM reaction times	
Preparation time for the operation of the CM after switching on the auxiliary power supply	≤ 15 s
Preparation time for the close operation of the CM after a previous close operation	≤ 10 s
Preparation time for the trip operation of the CM after switching on the auxiliary power supply	≤ 0.1 s
Trip capability after failure of the auxiliary power supply	≥ 60 s ¹⁾
CM supply voltage	
Rated range of supply voltage of CM_16_1(Par1_60.2_Par2Par3_Par4_Par5) ⁴⁾	24V to 60V DC
Rated range of supply voltage of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾	110V to 220V AC/DC
Operating range (80-120%) of CM_16_1(Par1_60.2_Par3_Par4_Par5) ⁴⁾	19V to 72V DC
Operating range (80-120%) of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾	85V to 265V AC/DC
Power consumption of CM	
Charging the close and trip capacitors of CM_16_1(Par1_60.2_Par3_Par4_Par5) ⁴⁾	≤ 25 W
Charging the close and trip capacitors of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾	≤ 42 W AC ²⁾ ≤ 37 W DC
Permanent power consumption (standby) of CM_16_1(Par1_60.2_Par3_Par4_Par5) ⁴⁾	≤ 5 W
Permanent power consumption (standby) of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾	≤ 7 W AC ³⁾ ≤ 5 W DC
Inrush current of CM_16_1(Par1_60.2_Par3_Par4_Par5) ⁴⁾ with discharged capacitors	≤ 120 A
Inrush current of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾ with discharged capacitors	≤ 18 A
Inrush time constant of CM_16_1(Par1_60.2_Par3_Par4_Par5) ⁴⁾ with discharged capacitors	≤ 0.5 ms
Inrush time constant of CM_16_1(Par1_220.2_Par3_Par4_Par5) ⁴⁾ with discharged capacitors	≤ 4 ms
Design, switching capacity of CM inbuilt relays	
Number of relays in CM	3
Number of available contacts for one relay	1 NO + 1 NC with common point
Rated voltage	240 V
Rated current AC	16 A
Maximum breaking power AC	4000 VA
Maximum switching current 250V DC	0.35 A
Maximum switching current 125V DC	0.45 A
Maximum switching current 48V DC	1.3 A
Maximum switching current 24V DC	12 A
Switching time	5 ms
"Close" and "Trip" dry contacts inputs of CM	
Output voltage	≥ 30 V
Contacts closed current	≥ 50 mA
Steady state current	≥ 5 mA

1) In case of Dry contacts "Close" and "Trip" are open.

2) At $\cos \varphi > 0.66$.

3) At $\cos \varphi > 0.33$.

4) "Par1", "Par3", "Par4" and "Par5" are listed on page 39.

Control Module EMC Parameters

PARAMETER	APPLICABLE STANDARD	RATED VALUE
Electromagnetic Compatibility (EMC) Requirements¹⁾		
Electrostatic discharge	IEC 60255-26 IEC 61000-4-2	8 kV contact 15 kV air
Radiated EM field Immunity	IEC 60255-26 IEC 61000-4-3	80 MHz – 3 GHz Sweep & spot AM 1 kHz 80% 10 V/m
Fast transient burst Immunity	IEC 60255-26 IEC62271-1 IEC 61000-4-4	4 kV common mode
Surge Immunity	IEC 60255-26 IEC 61000-4-5	4 kV common mode 2 kV differential mode
Conducted disturbance induced by Radio frequency fields	IEC 60255-26 IEC 61000-4-6	150 kHz – 80 MHz AM 1 kHz 80% 10 V
Power Frequency Magnetic Field	IEC 60255-26 IEC 61000-4-8	100 A/m continuously 1000 A/m 1 sec
Pulse Magnetic Field	IEC 61000-4-9	1000 A/m
100 kHz Damped Oscillatory Magnetic Field	IEC 61000-4-10	100 A/m
1 MHz damped oscillatory magnetic field	IEC 61000-4-10	100 A/m
AC Voltage Dips and Interruptions	IEC 60255-26 IEC 61000-4-11	ΔU 30% 1 period ΔU 60% 50 periods ΔU 100% 5 periods ΔU 100% 50 periods
Power Frequency Disturbance Voltage	IEC 60255-26 IEC 61000-4-16	300 V common mode 150 V differential mode ²⁾
100 kHz and 1 MHz Damped Oscillatory Wave Immunity	IEC 60255-26 IEC 62271-1 IEC 61000-4-18	2.5 kV common mode 1 kV differential mode
Ripple on DC Power Supply	IEC 60255-26 I IEC 61000-4-27	10% of Supply voltage, 100 Hz
DC Voltage Dips and Interruptions	IEC 60255-26 IEC 62271-100 IEC 61000-4-29	ΔU 30% 2 sec ΔU 60% 2 sec ΔU 100% 0.3 sec $\pm 20\%$ 10 sec

1) Cable from electronic relay to connector block should be shielded and the case grounded near the connector. The total length of unshielded wires from connector block to CM WAGO connector should not exceed 200 mm. Electromagnetic compatibility requirements are not applicable for the CM USB port as this port is used only for CM programming during production and not used under service conditions.

2) Test influence is not applicable for CM "Close" and "Trip" dry contacts.

Vacuum Circuit Breakers Selection Guide

Circuit Breaker Selection Guide



VCB15_LD1

Three Phase Light Duty Circuit Breakers

VCB15_LD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
	Without customization; 1NO+1NC aux contacts	2								
	Without customization; group package (12pcs)	3								
	Without customization; PD testing	4								
Rated voltage	12 kV		1							
	17.5 kV		2							
	17.5 kV (Capacitive)		3							
Rated short circuit breaking current	20 kA			1						
	16 kA			2						
Rated normal current	800 A				1					
Phase center distance	150 mm					1				
	180 mm					2				
	210 mm					3				
Main low terminal design	One main lower terminal						1			
	Two main lower terminal for PCD 150 mm (Continuous bus bars)						2			
CM settings	Basic circuit breaker functionality							1		
	Without CM							2		
Rated auxiliary supply voltage	24-60 V DC								1	
	110-220 V AC/DC								2	
	Without CM								3	
Language	English									1
	Spanish									2
	Portuguese									3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_LD8

Three Phase Light Duty Circuit Breakers

VCB15_LD8_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
	Without auxiliary switches boards, with position indicator	2								
	With one 3NO+3NC auxiliary switches board, with position indicator	3								
	Without auxiliary switches boards and without position indicator	4								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	25 kA			1						
Rated normal current	800 A				1					
Phase center distance	150 mm 210 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM									1 2 3
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_LD3

Single Phase Light Duty Circuit Breaker

VCB15_LD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	12 kV		1							
Rated short circuit breaking current	20 kA			1						
Rated normal current	800 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_MD1

Three Phase Medium Duty Circuit Breaker

VCB15_MD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
	For integration in AG16 draw out	2								
	For HS VSI-type retrofit	3								
	For Reyrolle LMx-type retrofit	4								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	1250 A				1					
Phase center distance	150 mm					1				
	210 mm					2				
	180 mm					3				
	275 mm					4				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality							1		
	Without CM							2		
Rated auxiliary supply voltage	24-60 V DC								1	
	110-220 V AC/DC								2	
	Without CM								3	
Language	English									1
	Spanish									2
	Portuguese									3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_MD3

Single Phase Medium Duty Circuit Breaker

VCB15_MD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	1250 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_SHELL2

Three Phase Shell Circuit Breaker

VCB15_SHELL2_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	12 kV 17.5 kV		1 2							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	1250 A 2000 A				1 2					
Phase center distance	150 mm 210 mm 275 mm					1 2 3				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_HD1

Three Phase Heavy Duty Circuit Breaker

VCB15_HD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	2500 A 3150 A				1 2					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal							1		
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB25_LD1

Three Phase Light Duty Circuit Breakers

VCB25_LD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV 24 kV		1 2							
Rated short circuit breaking current	16 kA 20 kA			1 2						
Rated normal current	800 A				1					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

Contact your nearest sales representatives to choose the option suitable for you



VCB25_LD3

Single Phase Light Duty Circuit Breaker

VCB25_LD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	24 kV		1							
Rated short circuit breaking current	16 kA 20 kA			1 2						
Rated normal current	800 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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VCB25_SHELL2

Three Phase Shell Circuit Breaker

VCB25_SHELL2_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	24 kV		1							
Rated short circuit breaking current	25 kA			1						
Rated normal current	2000 A 2500 A				1 2					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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CM_16_1

Control Module

CM_16_1		Par1	Par2	Par3	Par4	Par5
Language	English Spanish Portuguese	EN ES PT				
Rated supply voltage and CM hardware version	24-60 V DC , version 2 110-220 V AC/DC, version 2		60.2 220.2			
Firmware functionality	Basic circuit breaker functionality			1		
	Fast switching functionality			2		
	Basic circuit breaker functionality with increased "Open" command recognition time			3		
ISM driver firmware used in CM and protection setting ¹⁾	ISM15_LD_1 and without protection ISM15_LD_3 and without protection ISM15_LD_8 and without protection ISM15_MD_1 and without protection ISM15_MD_3 and without protection ISM15_Shell2 and without protection ISM15_HD_1 and without protection ISM25_Shell2 and without protection ISM25_LD_1 and without protection ISM25_LD_3 and without protection				15LD1-000 15LD3-000 15LD8-000 15MD1-000 15MD3-000 15Shell2-000 15HD1-000 25Shell2-000 25LD1-000 25LD3-000	
Factory configurable settings	Relay 1 - Switching module position functionality; Relay 2 - Ready functionality; Relay 3 - Malfunction or Loss of auxiliary supply functionality; Trip by dry contacts close; Close by dry contacts close;					A.A
	Relay 1 - Disable; Relay 2 - Ready functionality; Relay 3 - Ready functionality Trip by dry contacts close; Close by dry contacts close;					A.B
	Relay 1 - Ready functionality; Relay 2 - Ready functionality; Relay 3 - Ready functionality Trip by dry contacts close; Close by dry contacts close;					A.C

1) This parameter describes the ISM type(s) that the CM can control. To optimize the operation of each ISM, corresponding settings are used in the CM firmware. Usage of CM with incorrect type of ISM can lead to a mismatch of declared parameters of VCB.

Contact your nearest sales representatives to choose the option suitable for you

Draw-Out Units Selection Guide



VCB15_LD8

Draw-Out Unit with Light Duty Circuit Breaker

VCB15_LD8_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without slots	2											
Rated voltage	17.5 kV		1										
Rated short circuit current	25 kA			1									
Rated normal current	800 A				1								
Phase center distance	150 mm					1							
	210 mm					2							
Terminal center distance	205 mm						1						
Lower terminal height	260 mm							1					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary supply voltage	24-60 V DC									1			
	110-220 V AC/DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug										1		
	Metal plug										2		
Optional interlock	Without optional interlocks												1
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												2
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator												3
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												4
Language	English												1
	Spanish												2
	Portuguese												3

Contact your nearest sales representatives to choose the option suitable for you

Draw-Out Units Selection Guide



VCB15_MD1

Draw-Out Unit with Medium Duty Circuit Breaker

VCB15_MD1_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without slots	2											
Rated voltage	17.5 kV		2										
Rated short circuit current	31.5 kA			1									
Rated normal current	1250 A				1								
	800 A				2								
Phase center distance	150 mm					1							
	210 mm					2							
Terminal center distance	205 mm						1						
Lower terminal height	260 mm							1					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary supply voltage	24-60 V DC									1			
	110-220 V AC/DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug										1		
	Metal plug										2		
Optional interlock	Without optional interlocks												1
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												2
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator												3
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												4
Language	English												1
	Spanish												2
	Portuguese												3

Contact your nearest sales representatives to choose the option suitable for you



VCB15_HD1

Draw-Out Unit with Heavy Duty Circuit Breaker

VCB15_HD1_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without slots	2											
Rated voltage	17.5 kV		2										
Rated short circuit current	31.5 kA			1									
Rated normal current	2500 A					1							
	3150 A					2							
Phase center distance	210 mm					1							
	275 mm					2							
Terminal center distance	310 mm						1						
Lower terminal height	280 mm							1					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary supply voltage	24-60 V DC									1			
	110-220 V AC/DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug											1	
	Metal plug											2	
Optional interlock	Without optional interlocks												1
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												2
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator												3
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC												4
Language	English												1
	Spanish												2
	Portuguese												3

Contact your nearest sales representatives to choose the option suitable for you





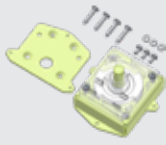
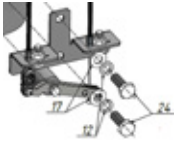




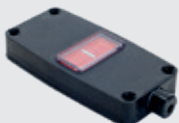

VCB25_SHELL2




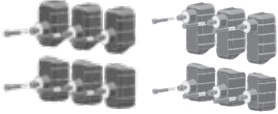
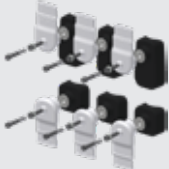
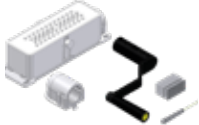


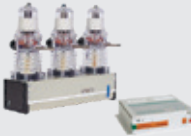
Draw-Out Unit with Shell Circuit Breaker



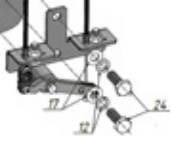
VCB25_SHELL2_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without closts	2											
	With motorized DOU cassette	3											
	With motorized DOU cassette and IP2X front cover without closts	4											
Rated voltage	24 kV		1										
Rated short circuit current	25 kA			1									
Rated normal current	630 A				1								
	1250 A				2								
	2500 A				3								
Phase center distance	210 mm					1							
	275 mm					2							
Terminal center distance	310 mm						1						
Lower terminal height	325 mm							1					
	345 mm							2					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary supply voltage	24-60 V DC									1			
	110-220 V AC/DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug										1		
	Metal plug										2		
Optional interlock	Without optional interlocks											1	
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											2	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator											3	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											4	
Language	English												1
	Spanish												2
	Portuguese												3

Contact your nearest sales representatives to choose the option suitable for you

VCB Accessories and spare parts

	<p>Manual generator The manual generator is used to charge the CM_16_1 in cases where the main auxiliary power supply is not available</p>
	<p>Interlocking kits The kit attaches to the ISM Interlocking shaft and serves as a manual trip / lockout accessory</p>
	
	
	
	
	
	<p>Release and indication cables The flexible release and indication cables are used for interlocks or ISM position indicator connection to the ISM</p>
	<p>Position indicator The position indicator used together with CBcomp_RelCable_1 to indicate the ISM main circuit position</p>
	<p>Mounting kit The kit is used with the ISM15_HD_1 only. The kit attaches to the ISM required mounting points to provide 95 kV BIL</p>

	<p>Connector The kit is used to provide Switchgear fixed contact counterpart for DOU main circuits connection</p>
	
	<p>Insulation kits The insulation kits provide compliance with declared BIL level (125 kV / 95 kV)</p>
	
	
	<p>Plug The kit is used to provide counterpart for draw-out unit (DOU) auxiliary circuits connector in the switchgear panel</p>
	
	<p>Draw-out unit interlocking kit The interlock blocks DOU rack in/out functionality in case auxiliary voltage (provided for solenoid installed on DOU plate) is absent</p>
	<p>Indoor switching module and control module Indoor switching module and control module can be ordered separately as spare parts</p>

FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT									
		VCB15							VCB25		
		LD1	LD3	LD8	MD1	MD3	HD1	Shell2	LD1	LD3	Shell2
 Manual generator CBunit_ManGen_1 for CM_16_1(Par1_220.2_Par3_Par4_Par5) ¹⁾ CBunit_ManGen_2 for CM_16_1(Par1_60.2_Par3_Par4_Par5) ¹⁾	•	•	•	•	•	•	•	•	•	•	
	•	•	•	•	•	•	•	•	•	•	
 Interlocking kit CBkit_Interlock_1 ²⁾	•	• ³⁾						•	• ³⁾		
 Interlocking kit CBkit_Interlock_LD(0_0_1) ^{4) 5)}	•							•			
 Interlocking kit CBkit_Interlock_8 ⁵⁾							•				
 Interlocking kit CBkit_Interlock_3(Par1) ⁶⁾ (rotary switch type)			•	•	•	•	• ⁷⁾			•	
 Interlocking kit CBkit_Interlock_4(Par1_EN) ⁸⁾ (key switch type)			•	•	•	•	• ⁷⁾			•	

1) "Par1", "Par3", "Par4" and "Par5" are listed on page 39.

2) The kit attaches to the ISM synchronizing shaft and serves as an interface for various manual trip / indication / lockout accessories.

3) Accessory or spare part is installed or included in the delivery.

4) This kit allows to attach a position indicator (CBkit_PosInd_1).

5) The kit attaches to the ISM Interlocking shaft and serves as an interface for manual trip / lockout accessories CBkit_Interlock_3/4/5 connection.

6) "Par1" is the cable length of 1000mm, 1500mm or 2000mm (other length on request).

7) CBkit_Interlock3/4/5 can be used with Shell2 VCBs only with the additional CBkit_Interlock_8 – approach local sales contact for assistance.

8) "Par1" is the cable length of 1000mm or 2000m (other length on request).

FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT								
		VCB15						VCB25		
		LD1	LD3	LD8	MD1	MD3	HD1	Shell2	LD1	LD3
 <p>Interlocking kit</p> <p>CBkit_Interlock_5(Par1)¹⁾ (push button type)</p>			•	•	•	•	• ²⁾			•
 <p>Release cable</p> <p>CBcomp_RelCable_3(Par1)³⁾ Relcable is included in the CBkit_Interlock_3/4/5 package</p>			• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾			• ⁴⁾
 <p>Indication cable</p> <p>CBcomp_IndCable_1(Par1)⁵⁾</p>			• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾			• ⁴⁾
 <p>Position indicator</p> <p>CBkit_PosInd_1</p>			• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾	• ⁴⁾			• ⁴⁾
 <p>Mounting kit</p> <p>CBmount_ISM15_1</p>						•				
 <p>Insulation kit</p> <p>CBkit_Ins_3</p>								•	• ⁴⁾	
 <p>Insulation kit</p> <p>CBkit_Ins_4 (Par1)⁶⁾</p>				•	•					

1) "Par1" is the cable length of 1000mm or 2000m (other length on request).



2) CBkit_Interlock3/4/5 can be used with Shell2 VCBs only with the additional CBkit_Interlock_8 – approach local sales contact for assistance.

3) "Par1" is the length of 500mm, 1000mm, 1500 or 2000mm (other length on request).

4) Accessory or spare part is installed or included in the delivery.

5) "Par1" is the length of 500mm, 1000mm, or 1500 (other length on request).

6) "Par1" is the bus bars type. "Par1" equals 1 - 40x10 mm (single or double bars) or "Par1" equals 2 - 80x10 mm (single bars).

FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT									
		VCB15						VCB25			
		LD1	LD3	LD8	MD1	MD3	HD1	Shell2	LD1	LD3	Shell2
 <p>Insulation kit</p>	CBkit_Shell15_1(205mm) and CBkit_Shell15_1(310mm)							• ¹⁾			
 <p>ISM and CM</p>	ISM15_XX ²⁾ ISM25_XX ²⁾ CM_16_1	• ³⁾	• ³⁾	• ³⁾	• ³⁾	• ³⁾	• ³⁾	• ³⁾	• ³⁾	• ¹⁾	• ¹⁾

1) PCD 150 mm version of VCB15_Shell2 is supplied with CBkit_Shell15 insulation kit.

2) ISM and CM are selected in accordance with the Circuit breaker version – approach local sales contact for assistance.

3) Accessory or spare part is installed or included in the delivery.

DRAW-OUT UNIT ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT			
		VCB15			VCB25
		LD8_D	MD1_D	HD1_D	SHELL2_D
 <p>Manual generator</p>	CBunit_ManGen_1 for CM_16_1(Par1_220.2_Par3_Par4_Par5) ¹⁾ CBunit_ManGen_2 for CM_16_1(Par1_60.2_Par3_Par4_Par5) ¹⁾	•	•	•	•
 <p>Connector</p>	SGkit_Connector_1(Par1_Par2) ²⁾	•	•	•	•
 <p>Plug</p>	CBkit_Plug_1(Plastic plug) ³⁾	•	•	•	•
 <p>Plug</p>	CBkit_Plug_1(Metal plug) ⁴⁾	•	•	•	•
 <p>Interlocking kit</p>	CBkit_Interlock_6(Par1) ⁵⁾	•	•	•	•
 <p>ISM and CM</p>	ISM15_XX ⁶⁾ ISM25_XX ⁶⁾ CM_16_1	• ⁷⁾	• ⁷⁾	• ⁷⁾	• ⁷⁾

1) "Par1", "Par3", "Par4" and "Par5" are listed on page 39.

2) "Par1" is the rated voltage of 17.5 kV or 24 kV. "Par2" is the rated normal current of 1250 A, 2000 A or 3150 A

3) Plastic plug has 58 pins.

4) Metal plug has 72 or 108 pins.

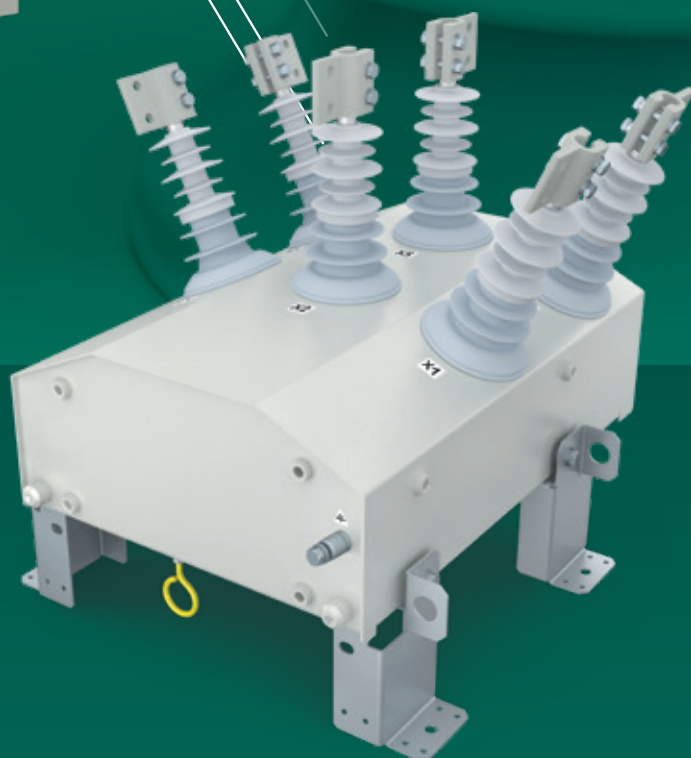
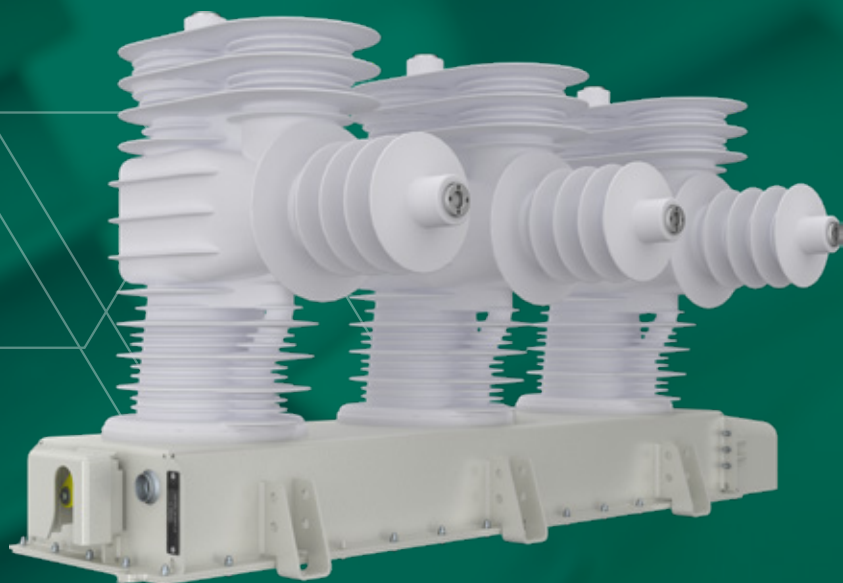
5) "Par1" - rated supply voltage 220 V AC/DC.

6) ISM and CM are selected in accordance with the Circuit breaker version – approach local sales contact for assistance.

7) Accessory or spare part is installed or included in the delivery.

Automatic Circuit Reclosers Rec15/25/35

Designed and built to last, the Tavrida Electric recloser combines the best of the Tavrida Electric vacuum circuit breaker's features: innovative insulation materials, high precision sensors and sophisticated numerical control.



FROM -50°C
TO +55°C



30.000 C-O OPERATIONS WITH RATED CURRENT
OR 200 OPERATIONS WITH FULL SHORT-CIRCUIT
BREAKING CURRENT

Application Areas



Feeder Automation

RADIAL LINE RECLOSER

When a recloser is installed on a radial feeder it automatically clears transient faults and isolates permanent faults. More than one recloser can be installed on a feeder to isolate faults selectively and ensure fewer customers are affected.

LOOP RECLOSER

A loop recloser further improves the reliability of a power supply by automatically

- Isolating faulty sections
- Reconfigures the network to minimize the amount of customers without power supply

Loop reclosers are the best option to maximize reliability performance indicators of your distribution network.



Substation Automation

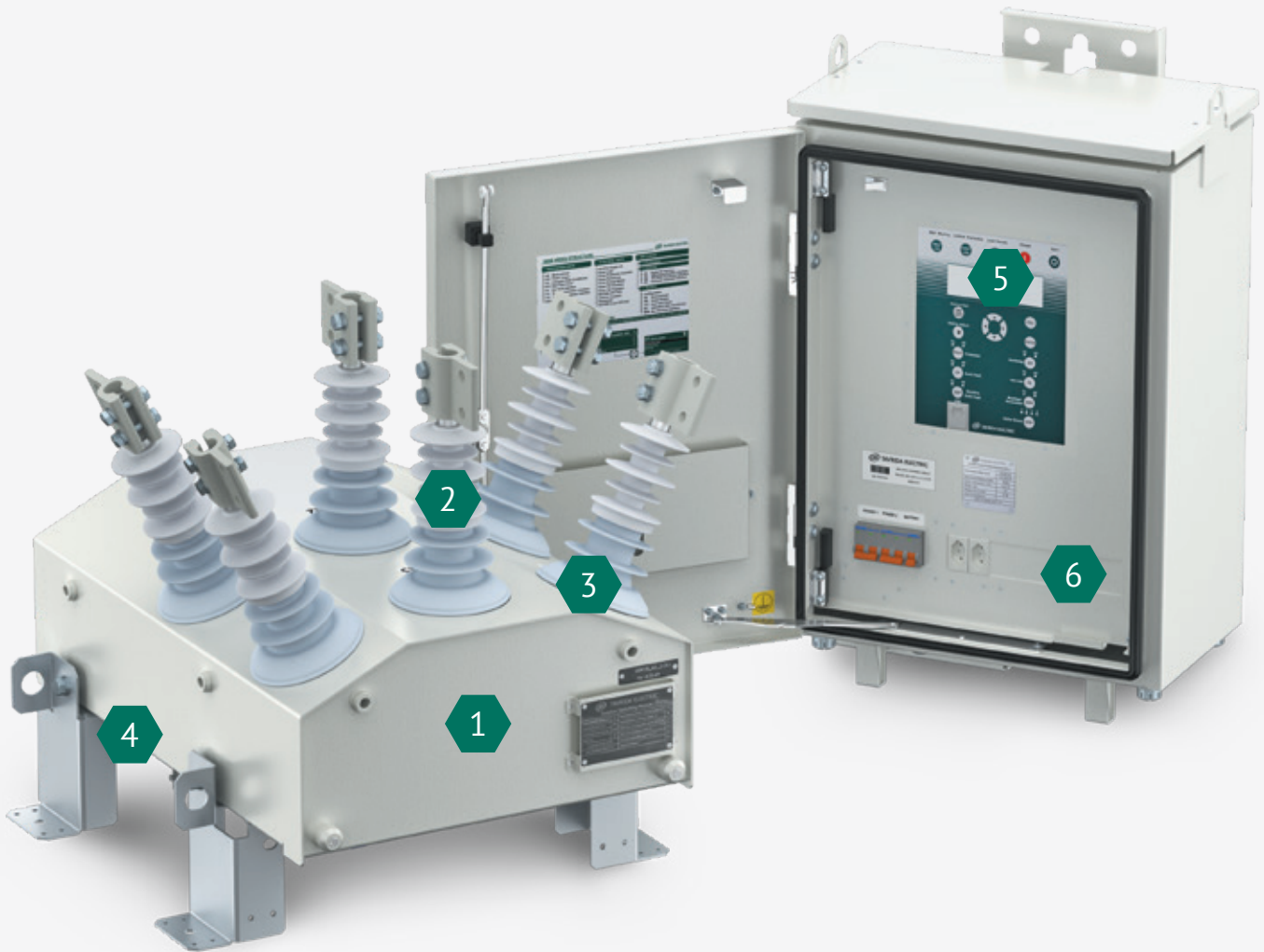
The Tavrida Electric recloser can be used to quickly build a cost-effective unmanned structure mounted outdoor substation. Providing full protection and automation functionality required at the substation.



Distributed Generation

The Tavrida Electric recloser is perfectly suited as the intertie between the distributed generation site and the utility grid. Tavrida Electric's experience with solar and other renewables has led to a variety of solutions that address the nuances of renewable generation requirements.

Design and Operation



- ① The air insulated, **corrosion-resistant** tank incorporates a solidly insulated circuit breaker, sensors and auxiliary mechanisms.
- ② Each of the six bushings are made of UV stable, hydrophobic polymer, that guarantees reliable performance in heavily polluted areas. Confirmed by environmental testing in KIPTS*.
- ③ The 6x current and 6x voltage high accuracy sensors. Voltage sensors allow measurements to be taken from either side of the recloser.
- ④ Mechanical trip hook for OSM manual operation. For **superior linesman safety**, the hook in the downwards position electrically isolates the actuator's circuit to prevent the possibility of any unintended recloser operation.
- ⑤ The recloser protects the network against overcurrent, earth faults, over- and under-voltage, over- and under-frequency, current and voltage imbalances, and many other problems. The control box has an embedded RTU that provides communication with SCADA over various communication protocols: DNP3, Modbus, IEC-104.
- ⑥ The control cubicle has an inbuilt large battery and smart battery charger to improve battery life. The battery allows 48 hrs of operation with no auxiliary power supply present.
- ⑦ TELARM**® user software allows local and remote device control and configuration, downloading loads, fault and load profiles and oscillogram. TELARM® is the first recloser software that allows automatic protection settings coordination, various failure modes simulation, devices configuration and remote control in single package!

* Koeberg Insulator Pollution Test Station (KIPTS) is known internationally as a severe environmental testing facility run by ESKOM, in South Africa

**Tavrída Electric Automated Relay Manager

Recloser Control – RC5



PROTECTION

The recloser protects against overcurrent, earth faults, over- and under-voltage, over- and under-frequency, current and voltage imbalances and many other problems.

MEASUREMENTS

The recloser can measure phase, neutral and sequence currents, phase-to-phase and sequence voltages and three-phase active and reactive power and energy. Key measurement data can be logged.

COMMUNICATIONS

The control cubicle has various communication interfaces and can be connected with any third party modem via RS-232/RS-485 or the Ethernet using various communication protocols, including Modbus, DNP3 and IEC-104.

LARGE BATTERY

48hrs operation battery, charged by smart battery charger and maintenance free for up to 10 years.

MONITORING

Highly comprehensive, remotely accessible separate log files for load and fault profiles, events, malfunctions, lifetime and change messages.

CONTROL CUBICLE

- The recloser control cubicle is made from lightweight powder-coated anodized aluminum,
- The control panel has a graphical LCD for clear event indication, comprising six-lines of 40-characters.

USER SOFTWARE

The Tavrida Electric Automated Relay Manager (TELARM) is designed for the specific needs of electricity distribution networks. It allows:

- Downloading of logs, profiles, oscillograms, settings, etc.
- Uploading protection, communication and systems settings,
- Recording of logs (event, malfunction, communication etc) and detailed fault profiling,
- The customising of a control signal map for a customer's SCADA applications.

* please consult local representative for additional information on these services.



Recloser Control Cubicle

Protection and automation functions

Function	ANSI function code	IEC function designation
Overcurrent	50/51	I>, I>>, I>>>
Earth Fault	50N/51N	I0>>, I0>>>, I0>>>>
Sensitive Earth Fault	50/51SEF	I0>/SEF
Auto-Reclose (4 shots)	79	AR
Automatic Backfeed Restoration	ABR	ABR
Undervoltage	27	U<
Voltage unbalance	47	U2/U1
Current unbalance	46	I2/I1
Underfrequency	81U	f<
Hot Line (live line)		
Overvoltage	59	U>
Overfrequency	81O	f>
Cold Load Pickup restrain		
Inrush filter	68	
Switch on to fault	50 SOTF	
Lockout	86	
Close Condition Verifier		
Sectionalizer functionality		
Fault locator		
User defined logic	PSL	
Controller self-supervision		
Circuit breaker supervision		

Communication			
Interfaces		Protocols	
RS-232	Bluetooth	IEC 60870-5-104	Modbus
RS-485	Ethernet	DNP3	TELARM® Protocol
Wi-Fi	USB		
GPRS	Optic fiber		

Specification

Recloser Technical Parameters



REC15



REC25



REC35

PARAMETER	OSM15_AL_1	OSM25_AL_1	SMART5
Rated maximum voltage (Ur)	15.5 kV	27 kV	38 kV
Rated continuous current (Ir)	630 A	630 A	800 A
Rated short-duration powerfrequency withstand voltage (Ud), 1 min dry	50 kV	60 kV	70 kV
Rated short-duration powerfrequency withstand voltage, 10 sec wet	45 kV	50 kV	70 kV
Rated lightning impulse withstand voltage (peak) (Up)	110 kV	125 (150) kV*	170 kV
Rated short-circuit breaking current (Isc)	16 kA	12.5 kA	16 kA
Rated peak withstand current (Ip)	41.6 kA	32.5 kA	52 kA
Rated short-time withstand current (Ik)	16 kA	12.5 kA	20 kA
Rated duration of short circuit (tk)	4 s	4 s	4 s
Rated cable-charging current switching	10 A	25 A	40 A
Rated line-charging current switching	2 A	5 A	5 A
Rated frequency (fr)	50/60 Hz		
Mechanical life (CO cycles)	30,000		20,000
Operating cycles, rated current (CO cycles)	30,000		20,000
Electrical endurance, breaking current (O-CO cycles)	50		
Closing time, not more than	77 ms		82 ms
Opening time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at I>2xIp)	43 ms		
Clearing time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at I>2xIp)	51 ms		
Rated operating sequence	O-0.1s-CO-2s-CO-2s-CO		
Main circuit resistance	< 85 μOhm	< 95 μOhm	< 40 μOhm
Weight	68 kg	72 kg	95 kg
Altitude	2000 m (derating according to ANSI C37.60 applied above 1000 m)		
Solar radiation	≤ 1.1 kW/m ²		
Temperature range	-40 °C ... +55 °C		
Degree of protection	IP 65		
Pollution level	very heavy (as per IEC 60815)		

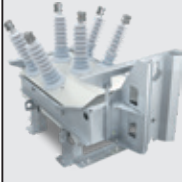
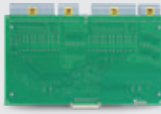









POWER SUPPLY CHARACTERISTICS

PARAMETER	VALUE
Supply voltage range, V	85 ÷ 265 AC, 110 ÷ 220 DC**
Rated power consumption, VA, not more	40
Maximum power consumption, VA, not more	75
Duration of operation without auxiliary supply, hours	48

* Across the vacuum gap, value in brackets - closed contacts

** Note that additional DC circuit breakers are required.

Accessories

	<p>Pole Mounting Kits Hot-dip galvanized steel mounting kits for Rec15/25 frontal and lateral pole installation. Mounting kits are applicable for all types of wooden, concrete or metal single poles and H-pole structures. Kits include accessories for control cubicle pole mounting and up to two voltage transformers installation</p>		<p>Input/Output Modules The RC5 can be supplied with an IOM on request to provide control and indication functions. IOM has 12 galvanically isolated digital inputs and 12 digital outputs with normally open and normally closed contacts</p>
	<p>Substation Mounting Kit Hot-dip galvanized steel mounting kit for Rec15/25 installation at outdoor substation. It can be installed at newly erected substation or as a retrofit to old outdoor circuit breakers</p>		<p>Interface Test Sets Custom designed tools for primary and secondary injection testing of Rec15/25 protection and automation functions</p>
	<p>Primary Line Connectors A wide range of terminals to provide a reliable primary line connection. Two-hole, four-hole and clamp type aerials options are available</p>		<p>Voltage Transformers Two-pole and single-pole auxiliary voltage transformers intended to supply control cubicle with low voltage</p>
	<p>Bird guards Custom designed bird guards to provide a protection against wildlife and aggressive environment</p>		<p>Interface Box OSM-RC Interface Box is required to connect OSM switching modules with conventional CTs to RC5 series control cubicles</p>
	<p>Power Cables and Earthing Accessories Common type wires and terminals to provide a connection between auxiliary VT and RC5 and to organize earthing scheme</p>		<p>Batteries Rechargeable battery to provide the RC5 with backup auxiliary power when the main auxiliary power source is not present</p>
	<p>Bluetooth Module Provides a wireless connection between the RC5 control cubicle and personal computer for local control and firmware update</p>		

Parametric Rec15/25 Selection Guide

REC15/25_AL1_5P	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
-----------------	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P1	Customization	Default	1
		Other – Contact Tavrída Electric representative	...
P2	OSM type	OSM with Rogowski coils and 220V actuator coil, version 5	1
		OSM with Rogowski coils as current sensors and 220V actuator coil, version 6 (with increased 3I0 measurement accuracy)	2
		OSM with Rogowski coils as current sensors and 220V actuator coil, version 7 (with increased 3I0 measurement accuracy)	3
P3	Language	According to customization – contact Tavrída Electric representative	1
		English MMI, stickers, nameplates for RC and OSM	2
		Portuguese MMI, stickers, nameplates for RC and OSM	3
		English MMI, stickers	4
		Portuguese MMI, stickers	5
		Spanish MMI, stickers	6
		Spanish MMI, stickers, nameplates for RC and OSM	7
P4	Controller type	Recloser control cubicle RC5_4	1
		Recloser control cubicle RC5_4 with stainless steel housing	3
P5	Firmware version	Factory default firmware	6
		Other – Contact Tavrída Electric representative	...
P6	OSM mounting kit	Without mounting kit	1
		Standard mounting kit without pole interface part	2
		Mounting kit with pole interface part for M16 studs	3
		Mounting kit with pole interface part for M20 studs	4
		Mounting kit with pole interface part for M20 studs for through the pole installation	5
		Mounting kit with M16 interface bracket for around the pole installation with 500 mm U-profiles fixed with 450 mm M16 studs	6
		Mounting kit with M20 interface bracket for around the pole installation with 700 mm U-profiles fixed with 450 mm M20 studs	7
		Mounting kit with M16 interface bracket for around the pole installation with 500 mm U-profiles bolted to interface bracket and 450 mm M16 studs	8
		Mounting kit with M20 interface bracket for around the pole installation with 700 mm U-profiles bolted to interface bracket and 450 mm M20 studs	9
		Substation mounting kit with adjustable height	A
		Mounting kit with pole interface part for M16 studs for through the pole installation	B
P7	AT mounting kit	Without	1
		Holder for cast resin VT	2
		Holder for cast resin VT for around the pole installation with two 500 mm U-profiles and M16 studs	3

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P7	AT mounting kit	Holder for cast resin VT for around the pole installation with two 700 mm U-profiles and M20 studs	4
		Two holders for cast resin VT for around the pole installation with two 500 mm U-profiles and M16 studs	5
		Two holders for cast resin VT for around the pole installation with two 700 mm U-profiles and M20 studs	6
		Two holders for cast resin VT for around the pole installation with four 500 mm U-profiles and M16 studs	7
		Two holders for cast resin VT for around the pole installation with four 700 mm U-profiles and M20 studs	8
		Cast resin VT installation kit for substation mounting kit	9
		Oil power transformer installation kit for substation mounting kit	A
		Cast resin CT installation kit for substation mounting kit	B
		Holder for cast resin VT for through the pole installation with base holder for M20 studs and 700 mm U-profile	C
		Holder for cast resin VT for through the pole installation with base holder for M20 studs, 700 mm U-profile and two M20 studs	D
		Two holders for cast resin VT for through the pole installation with base holder for M20 studs and two 700 mm U-profile	E
		Two holders for cast resin VT for through the pole installation with base holder for M20 studs, two 700 mm U-profile and M20 studs	F
		CRVT mounting kit for single lift installation	G
		2x CRVT mounting kit for single lift installation	H
P8	Control cable	5 meters with protective conduit	1
		7 meters with protective conduit	2
		12 meters with protective conduit	3
		20 meters with protective conduit	4
		No control cable provided	5
		5 meters	6
		7 meters	7
		12 meters	8
		20 meters	9
P9	Primary connector type	Without	1
		Two hole NEMA connector	2
		Two hole Burndy® connector	3
		Four hole NEMA connector	4
		Clamp type aerial connector with bird protection	5
		Two hole NEMA connector with bird protection	6
		Four hole NEMA connector with bird protection	7
		U-bolts of clamp type kit with fasteners	8
P10	Earthing accessories	Without	1
		According to customization – contact Tavrida Electric representative	2
		Two cross pressure terminals for 25–70 mm ² wire	3
P11	Power cable	Without	1
		According to customization – contact Tavrida Electric representative	2
		5 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	3

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P11	Power cable	7 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	4
		12 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	5
		20 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	6
		Two 5 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	7
		Two 7 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	8
		Two 12 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	9
		Two 20 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	A
		4.5 meters triple core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	B
		11 meters triple core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	C
		5 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	D
		7 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	E
		12 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	F
		20 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	G
		5 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	H
		7 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	J
		12 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	K
20 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	L		
5m 2core 2.5mm ² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	M		
P12	RC mounting kit	Without	1
		According to customization – contact Tavrída Electric representative	2
		800 mm U-profiles fastened to RC with M20 fasteners for around the pole installation with 1000 mm M16 studs	3
		RC installation kit for substation mounting kit	4
		500 mm U-profiles fastened to RC with M20 fasteners for around the pole installation with 450mm M16 studs	5
		Two 450 mm M20 studs	6
		Two 450 mm M16 studs	7
P13	Battery type	Without	1
		Battery ready	2
		-15 degrees rated battery	5
		-25 degrees rated battery	3
		-40 degrees rated battery	4
		-0 degrees rated battery (Lithium)	6
P14	Input-output module	Without	1
		12-60 VDC	2
		110-250 VDC	3
P15	Ethernet	Without	1
		Wired Ethernet (RJ45 interface)	2

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P15	Ethernet	Optical Ethernet	3
		Wired IEC 61850	4
P16	Local wireless access	Without	1
		Bluetooth	2
		Wi-Fi	3
P17	Power outlet	Socket wiring without socket holder cover	1
		Socket wiring with blank socket holder cover	2
		EU socket connected to AC1 power input	3
		Two NBR sockets	4
		Socket wiring with associated plate for two NBR sockets	5
		According to customization – contact Tavrida Electric representative	6
P18	Cabinet light	Without	1
		LED strip	2
P19	Internal door additional equipment	Without	1
		According to customization – contact Tavrida Electric representative	2
		Blank plate	3
		Kit of C-class LVSA wit In=10 kA for AC1 power input	4
P20	Bottom interface plate	Without	1
		According to customization – contact Tavrida Electric representative	2
		Blank plate	3
		Plate with two glands for d = 4.5–10 mm	4
		Plate with two glands for d = 4.5–10 mm and wireless module plug	5
		Plate with two Cnlinko® YM20 3pin male receptacles	6
		Plate with two Cnlinko® YM20 3pin male receptacles and WiFi/BT provision	7
		Plate with one CNLinko YM20 2pin male receptacles	8

Contact your nearest sales representatives to choose the option suitable for you

Parametric Rec35 Selection Guide

REC35_SMART5_5P	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
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PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P1	Customization	Default	1
		Other – Contact Tavrída Electric representative	...
P2	OSM type	35 kV Outdoor Switching Module with Rogowski coils and 220V actuator coil, version 1	1
P3	Language	English MMI, stickers	1
		Portuguese MMI, stickers	2
		Spanish MMI, stickers	3
		English MMI, stickers and nameplates	4
		Portuguese MMI, stickers and nameplates	5
		Spanish MMI, stickers and nameplates	6
		According to customization – contact Tavrída Electric representative	7
P4	Controller type	RC5 with DRVM-03 based RCM	1
		Basic RC5 with DRVM03-based RCM. Stainless steel housing.	3
P5	Firmware version	Factory-default firmware version	1
P6	OSM mounting kit	Clamp-ready mounting kit for frontal installation	1
		Around-pole mounting kit with 500mm U-profiles for frontal installation	2
		Around-pole mounting kit with 700mm U-profiles for frontal installation	3
		Through-pole mounting kit with M16 studs for frontal installation	4
		Through-pole mounting kit with M20 studs for frontal installation	5
		Clamp-ready mounting kit for universal installation	6
		Around-pole mounting kit with 500mm U-profiles for universal installation	7
		Around-pole mounting kit with 700mm U-profiles for universal installation	8
		Through-pole mounting kit with M16 studs for universal installation	9
		Through-pole mounting kit with M20 studs for universal installation	A
		Substation mounting kit with adjustable height	B
P7	AT mounting kit	Without	1
		1x cast resin transformer holder for frontal installation	2
		2x cast resin transformer holders for frontal installation	3
		1x cast resin transformer holder for universal installation	4
		2x cast resin transformer holders for universal installation	5
		Kit for CRVT installation on substation mounting kit	6
		Kit for oil PT installation on substation mounting kit	7
		Kit for external CT installation on substation mounting kit	8
P8	Control cable	Umbilical 5m for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	1
		Umbilical 5m (armored) for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	2

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P8	Control cable	Umbilical 7m for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	3
		Umbilical 7m (armored) for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	4
		Umbilical 12m for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	5
		Umbilical 12m (armored) for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	6
		Umbilical 20m for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	7
		Umbilical 20m (armored) for Smart_5/AL_1 (42 pin) and RC5_4 (32pin)	8
P9	Primary connector type	No additional connectors	1
		NEMA2 Bended bus aluminum connectors	2
		NEMA2 Bended bus aluminum connectors with bird protection	3
		NEMA4 Bended bus aluminum connectors	4
		NEMA4 Bended bus aluminum connectors with bird protection	5
P10	Earthing accessories	Without	1
		According to customization – contact Tavrída Electric representative	2
		Two cross pressure terminals for 25–70 mm ² wire	3
P11	Power cable	Without	1
		According to customization – contact Tavrída Electric representative	2
		5 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	3
		7 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	4
		12 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	5
		20 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	6
		Two 5 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	7
		Two 7 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	8
		Two 12 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	9
		Two 20 meters double core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	A
		4.5 meters triple core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	B
		11 meters triple core 1.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	C
		5 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	D
		7 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	E
		12 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	F
		20 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and crimp sleeve lug at RC side	G
		5 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	H
		7 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	J
		12 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	K
20 meters triple core 2.5 mm ² cable with 6 mm ring lug at VT side and Cnlinko® YM20 connector at RC side	L		
P12	RC mounting kit	Without RC mounting kit	1
		According to customization – contact Tavrída Electric representative	2

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P12	RC mounting kit	M20 studs for through-pole RC mounting	3
		500mm U-profiles for around-pole RC mounting	4
		800mm U-profiles for around-pole RC mounting	5
		Universal RC MK for substation mounting kit	6
		M16 studs for through-hole RC mounting	7
P13	Battery type	Without	1
		Battery ready	2
		-15 degrees rated battery	5
		-25 degrees rated battery	3
		-40 degrees rated battery	4
		-0 degrees rated battery (Lithium)	6
P14	Input-output module	Without input-output module	1
		12-60 VDC input-output module	2
		110-250 VDC input-output module	3
P15	Ethernet	Without	1
		Wired Ethernet (RJ45 interface)	2
		Optical Ethernet	3
		Wired IEC 61850	4
P16	Local wireless access	Without	1
		Bluetooth	2
		Wi-Fi	3
P17	Power outlet	Socket wiring without socket holder cover	1
		According to customization – contact Tavrída Electric representative	2
		Blank socket plate, wiring	3
		NBR socket plate, wiring	4
		2 NBR sockets, associated plate, wiring	5
		EU socket, associated plate, wiring	6
P18	Cabinet light	Without	1
		LED strip	2
P19	Internal door additional equipment	Without	1
		According to customization – contact Tavrída Electric representative	2
		Blank plate	3
		Kit of C-class LVSA wit In=10 kA for AC1 power input	4
P20	Bottom interface plate	Without	1
		According to customization – contact Tavrída Electric representative	2
		Blank plate	3
		Plate with two glands for d = 4.5-10 mm	4
		Plate with two glands for d = 4.5-10 mm and wireless module plug	5
		Plate with two Cnlinko® YM20 connectors	6
		Plate with two Cnlinko® YM20 connectors and wireless module plug	7

Contact your nearest sales representatives to choose the option suitable for you

Certificates

“DEKRA Certification B.V.” auditors praised the “Tavrída Electric” quality management system and noted attention and active involvement of managers and staff at all levels in the continuous improvement of the company’s operations.

- ISO 9001:2015
- ISO 14001:2015
- OHSAS 18001:2007



Tavrída Electric Vacuum Circuit Breakers

Tavrída Electric VCBs are designed and manufactured to strictly comply with the latest revision of IEC 62271-100. World known independent Laboratories STL liaison members.

Each assembled VCB is subjected to routine testing in accordance with IEEE C37.60/IEC 62271-100 at the factory



TYPE TESTS

- Dielectric tests
- Measurement of the resistance of the main circuit
- Temperature rise test
- Short-time withstand current and peak withstand current test
- Extended mechanical operation test
- Short-circuit current making and breaking test
- Single and double earth fault test
- Shortline fault test
- EMC tests for control electronics
- Extended electrical endurance test
- Capacitive currents switching test



ROUTINE TESTS

- Visual check and functionality tests
- Dielectric withstand test
- Measurement of the resistance of main circuit
- Mechanical operation test

Tavrída Electric Reclosers

The Rec series automatic circuit reclosers are designed and manufactured to strictly comply with the latest revisions of IEEE C37.60 and IEC 62271-111

Each assembled Rec series recloser is subjected to routine testing in accordance with IEEE C37.60/IEC 62271-111 at the factory



TYPE TESTS

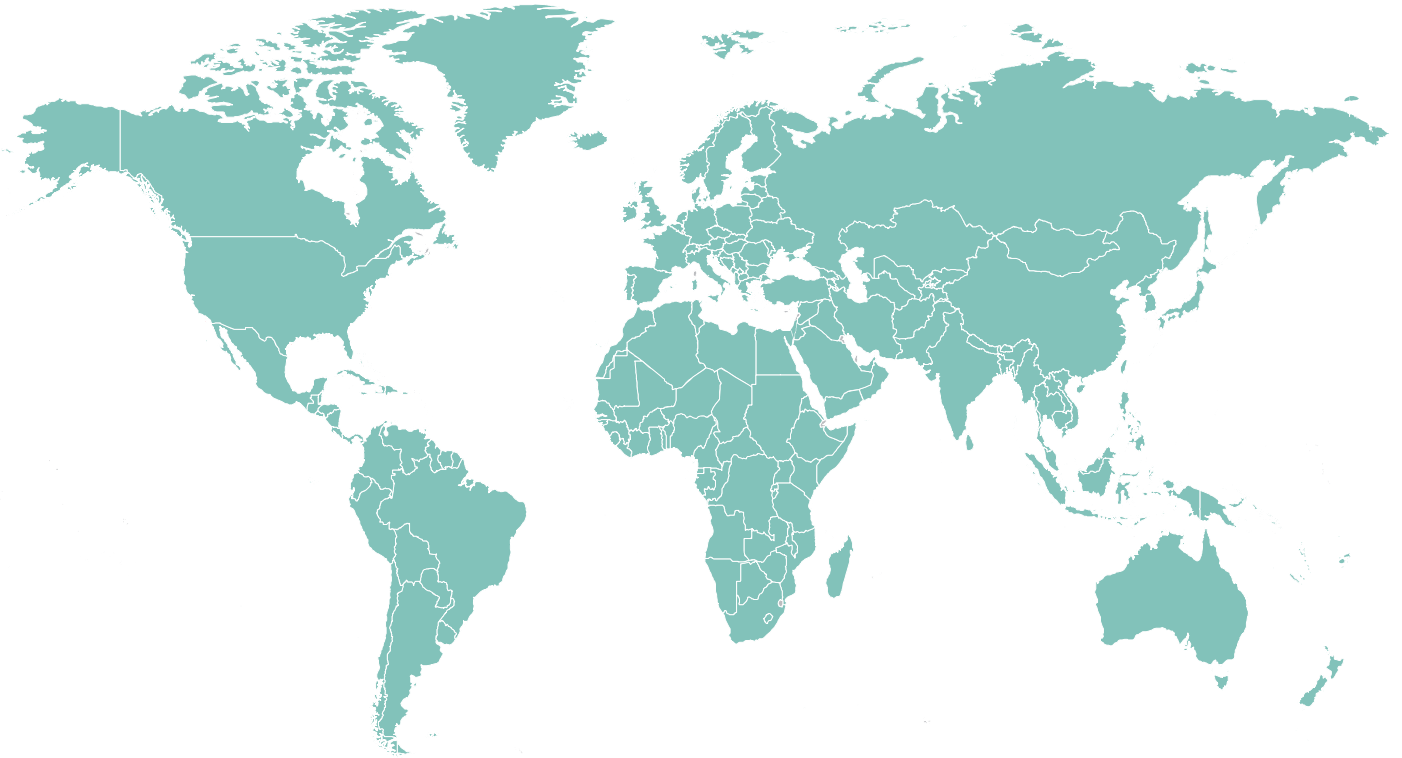
- Dielectric tests
- Measurement of the resistance of the main circuit
- Temperature rise test
- Short-time withstand current and peak withstand current test
- Extended mechanical operation test
- Short-circuit current making and breaking test
- EMC tests for control electronics
- Capacitive currents switching test

ROUTINE TESTS

- Visual check and functionality tests
- Dielectric withstand test
- Measurement of the resistance of main circuit
- Reclosing and overcurrent calibration
- Mechanical operation test
- Partial discharge test



If you would like to obtain more detailed information about our solutions or become one of our local partners, please feel free to contact us



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